the region within which icebergs or field ice were reported for February during the last six years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
	° ′	° ′		° ′	° ′
February, 1883	42 01	52 46	February, 1883	46 19	45 44
February, 1884	42 00	50 00	February, 1884	46 50	43 45
February, 1885	41 50	51 12	February, 1885	47 52	42 00
February, 1886	46 10	47 15	February, 1886	48 00	44 47
February, 1887	40 00	48 00	February, 1887	46 26	41 50
February, 1888	44 59	45 08	February, 1888	44 59	45 08

From the above it will be seen that during February, 1888, ice was encountered about 3° north and 1° west of the average southern and eastern limits for the month, as determined from observations taken during the preceding five years.

Field ice has been reported for February, 1888, as follows: 9th, ice drove in the harbor of Saint John's, N. F., and on the 11th heavy ice prevented vessels from entering that port; 13th, drift ice reported close in on the land off the southeast coast of Newfoundland; 17th, s. s. "Bengore Head" encountered ice from N. 47° 16′, W. 51° 53′ to N. 45° 58′, W. 52° 50′; 19th, 21st, 26th, and 28th, ice reported off the south and southeast coasts of Nova Scotia; 28th, the s. s. "Toledo" passed a quantity of loose ice in N. 44° 59′, W. 45° 08′. In January, 1888, two icebergs were reported over the Banks southeast of Saint John's, N. F.

No icebergs have been reported for February, 1888. This fact constitutes a noteworthy feature which is unparalleled in the six-year February ice-record of this office. The quantity of field ice reported was also largely deficient, when compared with the average for the month.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

The distribution of mean temperature over the United States and Canada for February, 1888, is exhibited on chart ii by dotted isothermal lines. In the table of miscellaneous data are given the monthly mean temperatures, with the departures from the normal, for the various stations of the Signal Service. The figures opposite the names of the geographical districts in the columns for mean temperature, precipitation, and departures from the normal, show respectively the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal, and subtracting when above.

East of the Mississippi River and north of the thirty-fifth parallel the mean temperatures were normal or below. In the extreme northwest, Ohio Valley, and south Atlantic states the mean temperature did not differ more than 0°.2 from the normal, and in New England it amounted to only 0°.8. The greatest deficiency in the monthly mean temperature occurred in the upper Mississippi valley, where it averaged nearly 4°; in the upper lake region the deficiency amounted to 2°.5.

In the Gulf States, Missouri Valley, Rocky Mountain and Pacific coast districts, except in southern California (where the temperature was nearly normal), the month was decidedly warmer than the average, the excess over the normal temperature amounting to more than 4° over the greater part of the area embraced by the districts named, and ranging from 6° to 10° in the northern and central Rocky Mountain regions.

The following are the most marked departures from normal temperatures at Signal Service stations:

Above normal.	°	Below normal.	°
Helena, Mont	11.0	La Crosse, Wis	5.4
Denver, Colo	7.6	Davenport, Iowa	5.2
Boisé City, Idaho	7.3	Marquette, Mich	5.0
Cheyenne, Wyo	6.9	Chicago, Ill	5.0
Dodge City, Kans	6.7	Springfield, Ill	4.7
Salt Lake City, Utah	6.5	Saint Paul, Minn	4.6
North Platte, Nebr	6.5	Dubuque, Iowa	4.2
Fort Custer, Mont	6.3	Port Huron, Mich	3.9

Chart iii shows for certain Signal Service stations curves representing current and normal February temperatures for each day of the month.

DEVIATIONS FROM NORMAL TEMPERATURES.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperatures for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for February, 1888; (4) the departures of the current month from the normal; (5) and the extreme monthly means for February during the period of observations and the year of occurrence:

State and Station.	County.	(1) Normal for the month of Feb.	(2) Length of record.	(3) Mean for February, 1888.	(4) Departure from normal.	(5) Extreme monthly mean temperature for February.			
						Highest.		Lowest.	
						Am't.	Year.	Am't.	Year.
		°	Years	°	°	°		°	
Arkansas.									
Lead Hill	Boone	39.5	6	41.1	+1.6	49.7	1882	32.2	1885
California.									
Sacramento	Sacramento	49.6	22	47.9	−1.7	55.9	1870	43.2	1883
Salinas	Monterey	47.6	16	50.3	+2.7	52.6	1881	40.0	1884
Florida.									
Merritt's Island	Brevard	64.8	5	64.8	0.0	69.5	1887	60.2	1886
Illinois.									
Golconda	Pope	38.0	9	35.3	−2.7	.....	.....	.....	.....
Greenville	Bond	32.4	9	29.8	−2.6	.....	.....	.....	.....
Peoria	Peoria	29.3	32	28.4	−0.9	.....	.....	.....	.....
Prairieville	Lee	25.1	33	20.1	−5.0	.....	.....	.....	.....
Riley	McHenry	21.8	27	17.5	−4.3	.....	.....	.....	.....
Sandwich	De Kalb	22.4	38	23.8	+1.4	.....	.....	.....	.....
Indiana.									
Logansport	Cass	28.5	34	28.4	−0.1	42.2	1882	22.0	1872
Spiceland	Henry	27.0	34	30.5	+3.5	.....	.....	.....	.....
Vevay	Switzerland	35.9	21	33.8	−2.1	.....	.....	.....	.....
Iowa.									
Cresco	Howard	15.7	16	12.9	−2.8	.....	.....	.....	.....
Monticello	Jones	21.4	34	18.1	−3.3	34.6	1878	7.5	1875
Kansas.									
Lawrence	Douglas	32.0	21	32.7	+0.7	41.6	1882	20.8	1885
Wellington	Sunman	36.7	10	39.0	+2.3	40.1	1882	24.6	1885
Yates Centre	Woodson	29.8	8	34.7	+4.9	39.6	1882	21.1	1685
Louisiana.									
Point Pleasant	Tensas	49.8	7	51.6	+1.8	.....	.....	.....	.....
Maine.									
Gardiner	Kennebec	20.5	52	21.3	+0.8	.....	.....	.....	.....
Maryland.									
Cumberland	Alleghany	32.8	16	32.8	0.0	38.0	1877 '82	25.0	1875
Massachusetts.									
Somerset	Bristol	27.4	18	28.6	+1.2	.....	.....	.....	.....
Newburyport	Essex	26.5	9	26.4	−0.1	30.5	1880 '84	19.3	1885
Michigan.									
Thornville	Lapeer	24.6	12	22.5	−2.1	.....	.....	.....	.....
Kalamazoo	Kalamazoo	25.4	13	22.8	−2.6	.....	.....	.....	.....
Adrian	Lenawee	26.9	10	23.4	−3.5	.....	.....	.....	.....
New Hampshire.									
Concord	Merrimac	24.3	17	23.0	−1.3	32.7	1880	14.3	1875
New Jersey.									
South Orange	Essex	29.8	18	29.4	−0.4	34.3	1877	22.8	1885
Moorestown	Burlington	31.2	25	32.1	+0.9	37.2	1865	21.6	1885
New York.									
Palermo	Oswego	21.3	35	19.8	−1.5	27.8	1854	12.7	1875
Ohio.									
North Lewisburg	Champaign	30.5	57	31.2	+0.7	.....	.....	.....	.....
Wauseon	Fulton	25.6	18	24.7	−0.9	35.4	1882	11.3	1875
Oregon.									
Albany	Linn	40.3	9	44.3	+4.0	47.0	1885	32.7	1887
Pennsylvania.									
Dyberry	Wayne	22.5	24	20.9	−1.6	29.3	1867	13.6	1868,'75,
Grampian Hills	Clearfield	24.6	24	25.5	+0.9	.....	.....	.....	[1885
Wellsborough	Tioga	24.5	11	26.3	+1.8	30.3	1884	22.3	1877
South Carolina.									
Statesburg	Sumter	50.9	8	49.8	−1.1	55.2	1884	41.8	1885
Tennessee.									
Milan	Gibson	41.0	6	41.2	+0.2	.....	.....	.....	.....
Texas.									
New Ulm	Austin	56.3	16	55.5	−0.8	61.9	1882	52.6	1883
Strafford	Orange	18.7	13	17.4	−1.3	25.7	1877	11.0	1885
Virginia.									
Bird's Nest	Northampt'n	41.9	19	40.0	−1.9	47.8	1880	34.8	1875
Dale Enterprise	Rockingham	35.0	8	41.4	+6.4	42.4	1883	23.9	1885
Variety Mills	Nelson	38.6	11	37.8	−0.8	43.4	1884	29.6	1885
Wytheville	Wythe	37.0	24	40.0	+3.0	43.0	1884	30.0	1885
West Virginia.									
Helvetia	Randolph	35.5	12	37.2	+1.7	42.0	1887	25.7	1885

Table of comparative maximum and minimum temperatures for February.

State or Territory.	Stations.	For 1888.		Since establishment of station.				Length of record.
		Max.	Min.	Max.	Year.	Min.	Year.	
		°	°	°		°		Yrs.
Alabama	Mobile	75.3	30.0	80.5	1887	19.3	1886	18
Do	Montgomery	69.8	24.8	81.2	1883	14.4	1886	16
Arizona	Prescott	63.2	22.5	80.0	1879	—11.0	1880	12
Do	Fort Apache	68.1	23.9	74.0	1881	— 9.0	1880	10
Arkansas	Fort Smith	69.8	16.5	78.4	1883	1.0	1885	6
Do	Little Rock	75.0	18.0	77.0	1882	7.6	1886	9
California	San Francisco	76.3	41.9	71.0	1886	33.1	1887	17
Do	San Diego	66.8	42.5	82.6	1883	35.0	1880	17
Colorado	Denver	70.5	15.5	72.0	1879	—22.0	1883	16
Do	Montrose	56.6	15.9	59.0	1887	2.3	1887	4
Connecticut	New Haven	48.7	— 1.5	65.0	1880	— 7.7	1886	16
Do	New London	50.0	— 0.6	62.0	1880	— 6.0	1871	15
Dakota	Fort Buford	49.2	—27.8	57.0	1882	—41.2	1887	10
Do	Yankton	55.8	—19.4	68.0	1876	—24.8	1886	15
Dis. of Columbia	Washington City	61.0	12.6	78.0	1874	— 2.3	1886	18
Florida	Jacksonville	81.7	32.5	83.6	1887	24.3	1886	17
Do	Key West	80.5	58.8	87.0	1874	52.3	1886	18
Georgia	Atlanta	68.0	13.0	74.5	1883	8.0	1885	10
Do	Savannah	72.0	27.0	80.0	1883	19.0	1886	18
Idaho	Boisé City	63.8	24.0	65.2	1880	—12.0	1883	11
Illinois	Cairo	65.5	9.5	74.0	1883	— 2.6	1886	17
Do	Chicago	47.2	—17.5	63.0	1880	—13.7	1885	16
Indiana	Indianapolis	59.8	— 2.1	72.0	1883	— 9.0	1885	15
Indian Ter	Fort Sill	74.8	18.8	79.0	1879, 1880	— 3.5	1883	11
Iowa	Dubuque	51.0	—23.0	67.2	1882	—31.0	1875	15
Do	Des Moines	57.2	—20.6	68.0	1880	—23.0	1883	10
Kansas	Dodge City	78.3	4.5	78.0	1876	—20.0	1883	14
Do	Leavenworth	62.9	— 5.0	73.0	1876	—16.2	1885	17
Kentucky	Louisville	66.8	8.0	77.9	1887	— 1.3	1885	16
Louisiana	New Orleans	78.7	35.0	81.5	1887	25.0	1886	18
Do	Shreveport	74.8	32.5	80.5	1876	14.6	1885	15
Maine	Eastport	45.8	— 8.3	48.6	1886	—20.0	1876	15
Do	Portland	43.9	— 7.0	58.0	1880	—10.2	1886	17
Maryland	Baltimore	59.9	11.1	78.0	1874	— 1.1	1886	16
Massachusetts	Boston	56.0	— 4.0	64.0	1880	— 6.6	1886	18
Michigan	Marquette	40.2	—26.6	69.0	1877	—27.0	1875	13
Do	Grand Haven	43.7	— 7.0	58.0	1880	—24.0	1875	16
Minnesota	Saint Vincent	39.0	—49.9	49.5	1886	—29.2	1885	8
Do	Saint Paul	45.3	—33.0	59.0	1880	—32.0	1875	17
Mississippi	Vicksburg	74.0	28.0	83.1	1883	16.0	1886	16
Missouri	Saint Louis	62.8	— 3.5	74.1	1887	— 7.9	1886	18
Montana	Ft. Assinaboine	49.2	—21.8	63.2	1886	—55.4	1887	9
Do	Helena	56.5	— 1.0	62.1	1886	—40.5	1887	8
Nebraska	North Platte	67.8	— 4.2	68.3	1882	—22.2	1885	14
Do	Omaha	62.5	—17.2	66.0	1880	—24.9	1883	16
Nevada	Winnemucca	62.9	—16.6	69.0	1879	—19.5	1883	10
New Jersey	Atlantic City	55.2	2.7	71.0	1880	— 5.0	1875	15
New Mexico	Santa Fé	55.0	16.0	75.0	1879	— 3.0	1879, 1880	16
New York	Buffalo	51.2	— 8.0	63.8	1883	—13.0	1875	16
Do	New York City	54.8	3.0	69.0	1874	— 4.0	1873	17
North Carolina	Charlotte	70.0	15.5	76.5	1883	5.9	1886	10
Do	Wilmington	72.0	24.6	81.0	1880	10.0	1886	18
Ohio	Cincinnati	61.2	5.6	73.0	1883	— 9.6	1885	18
Do	Sandusky	53.1	— 3.0	70.0	1883	—14.9	1885	11
Oregon	Portland	60.8	30.0	65.0	1886	7.0	1883	15
Do	Roseburg	67.2	28.2	72.1	1886	3.3	1884	11
Pennsylvania	Pittsburg	61.1	1.1	76.5	1883	—10.0	1875	15
Do	Philadelphia	58.5	2.5	75.0	1874	— 2.4	1886	18
Rhode Island	Block Island	48.8	0.9	54.1	1887	— 1.0	1886	9
South Carolina	Charleston	71.8	27.5	80.4	1887	13.3	1886	15
Tennessee	Knoxville	67.0	9.1	79.0	1871	— 4.1	1886	18
Do	Memphis	71.0	21.0	79.0	1883	5.8	1886	16
Texas	Brownsville	83.9	45.9	85.0	1876	27.0	1883	13
Do	Fort Elliott	78.0	9.4	78.0	1880	—10.0	1883	9
Utah	Salt Lake City	58.7	23.5	68.0	1879	—13.0	1884	14
Virginia	Lynchburg	66.0	11.3	75.0	1874	1.3	1886	15
Do	Norfolk	68.7	17.2	81.0	1871	3.5	1886	18
Washington	Spokane Falls	58.0	22.0	55.3	1886	—25.1	1883	8
Do	Olympia	59.0	29.0	61.0	1886	2.0	1884	11
Wisconsin	La Crosse	48.0	—28.0	65.0	1882	—34.0	1875	16
Do	Milwaukee	45.3	—20.7	60.0	1882	—23.6	1885	18
Wyoming	Cheyenne	56.2	7.5	63.2	1886	—28.2	1884	15

RANGES OF TEMPERATURE.

The monthly and the greatest and least daily ranges of temperature at Signal Service stations are given in the table of miscellaneous meteorological data. In the extreme northwest, upper Mississippi and Missouri valleys the monthly ranges generally varied from 70° to 85°; along the Gulf and Pacific coasts they were less than 40°, being below 30° at most stations.

In the table below are given some of the greatest and least monthly ranges for February, 1888, with the maximum ranges for any month since the establishment of station:

Stations.	For February, 1888.	Greatest in any month since establishment of station.	Length of record, years.	Stations.	For February, 1888.	Greatest in any month since establishment of station.	Length of record, years.
	°	°			°	°	
Saint Vincent, Minn.	88.9	99.3	8	Tatoosh Island, Wash.	16.4	41.4	5
Moorhead, Minn.	85.0	93.5	8	Key West, Fla	21.7	46.0	18
Duluth, Minn	82.5	80.4	18	Fort Canby, Wash.	21.2	44.3	5
Davenport, Iowa	80.1	73.0	17	Astoria, Oregon	22.0	.....	.....
Omaha, Nebr	79.7	93.2	18	Port Angeles, Wash.	23.1	42.0	4
Fort Totten, Dak.	79.1	93.2	4	San Diego, Cal.	26.3	55.0	18
Concordia, Kans	78.9	96.5	4	Olympia, Wash.	30.0	57.8	11
Saint Paul, Minn	78.3	90.7	18	San Francisco, Cal.	34.4	50.3	17

From the above table it will be seen that the monthly ranges at Duluth, Minn., and Davenport, Iowa, for February, 1888, are the greatest that have yet occurred at those stations. The greatest monthly range of temperature shown by records of the Signal Service, is 117°, which occurred at Fort Benton, Mont., in December, 1880.

FROST.

It is not considered of sufficient importance to give a detailed statement of the occurrence of frost in the Northern States. In Southern States, where the monthly mean temperatures generally ranged above 50°, frost occurred as follows:

Alabama.—8th, 9th, 12th, 13th, 14th, 26th to 29th.
Arizona.—2d to 9th, 11th to 14th, 19th to 25th, 27th.
Arkansas.—6th, 8th, 12th, 13th, 16th, 19th to 25th, 27th.
California.—1st to 10th, 15th to 20th, 22d to 25th, 27th to 29th.
Florida.—14th, 20th, 26th to 29th.
Georgia.—9th, 13th, 14th, 17th, 18th, 26th to 29th.
Louisiana.—8th, 12th to 14th, 17th, 19th, 25th to 29th.
South Carolina.—1st to 3d, 9th, 13th to 19th, 26th to 29th.

The most southerly stations reporting frost were as follows: Mobile, Ala., 27th; Fort Huachuca, Ariz., 3d, 5th, 8th, 20th, 21st; Riverside, Cal., 2d, 3d, 5th, 7th, 8th, 20th, 24th; Archer, Fla, 14th, 28th, 29th; Cedar Keys, Fla., 28th; Quitman, Ga., 28th, 29th; New Orleans, La., 27th, 28th; Abbeville, La., 28th; Biloxi, Miss., 28th.

TEMPERATURE OF WATER.

The following table shows the temperature of the sea-water for February, 1888, observed, under conditions as given, at the harbors of the several stations; the monthly range of water temperature; the average depth at which the observations were made, and the mean temperature of the air:

Station.	Temperature at bottom.				Mean temperature of air at the station.	Average depth of water in feet and tenths.
	Max.	Min.	Range.	Monthly mean.		
	°	°	°	°	°	
Canby, Fort, Wash.	47.5	40.5	7.0	44.1	43.3	14.8
Cedar Keys, Fla	70.3	56.0	14.3	64.3	61.7	7.9
Charleston, S. C.	56.0	49.5	6.5	53.4	54.0	34.2
Eastport, Me	35.5	32.6	2.9	33.3	22.6	16.0
Galveston, Tex	61.7	55.7	6.0	58.9	58.8	14.8
Key West, Fla*	79.0	69.0	10.0	75.1	72.4	18.1
New York City	36.6	31.0	5.6	32.0	31.6	13.0
Pensacola, Fla	65.4	53.2	12.2	61.0	58.9	17.3
Portland, Me	32.6	29.4	3.2	30.7	23.2	15.7
Portland, Oregon	46.0	40.7	5.3	43.6	44.0	55.8

* Record for 27 days.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for February, 1888, as determined from the reports of about eight hundred stations, is exhibited on chart iv. In the table of miscellaneous meteorological data are given, for each Signal Service station, the total precipitation, with the departures from the normal. The figures opposite the names of the geographical districts in columns for mean temperature, precipitation, and departures from the normal, show respectively the average for the several districts. The normal for any district may be found by adding the departure to the current